

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

Claims 1-8 (Cancelled).

9. (New) An ozone generating apparatus comprising:

an ozone generator including

a discharge chamber having a high voltage terminal and a low voltage terminal, and

a plurality of multi-layer flat-ozone generating units stacked within the discharge chamber, each ozone generating unit including, alternately stacked, a plurality of flat-plate high-voltage electrodes and low-voltage electrodes, wherein the multi-layer flat-plate ozone generating units are electrically divided into n groups within the discharge chamber, high-voltage electrode terminals of the multi-layer flat-plate ozone generating units within each group are connected together, and low-voltage electrode terminals of all multi-layer flat-plate ozone generating units are connected together; and

an n-phase power supply supplying power to the plurality of multi-layer flat-ozone generating units, the n-phase power supply including

a polyphase rectifier rectifying polyphase alternating current (AC) power received from a commercial power source to produce a rectified voltage,

an n-phase inverter receiving the rectified voltage and producing n-phase AC power, in each of n phases, at a higher frequency than the AC power received from the commercial source,

n serial reactors, one serial reactor being connected in series with each of the phases of the n-phase AC power, and

an n-phase transformer receiving the n-phase AC power transmitted by the n serial reactors and increasing the voltage of the n-phase AC power to produce n-phase high voltage AC power, each phase of the n-phase transformer being connected to a respective high-voltage electrode terminal of a corresponding group of the multi-layer flat-plate ozone generating units; and

a time division device equally dividing time into at least 3 and no more than n respective sequential intervals and issuing time-decoded signals to the n-phase inverter for controlling phases of the n-phase inverter while maintaining balance gradually for at least 3 of the phases and up to all of the n phases.

10. (New) The ozone generating apparatus according to claim 9, wherein the n-phase power supply includes a single low-voltage output that is electrically connected to the low-voltage electrode terminal of the discharge chamber.

11. (New) The ozone generating apparatus according to claim 10 including n parallel reactors, each parallel reactor being connected between a respective phase of the n-phase transformer and the low-voltage terminal of the discharge chamber.

12. (New) The ozone generating apparatus according to claim 9, wherein the n-phase transformer includes

a central polygonal core having a polygonal cross-section with at least n sides, a plurality of U-shaped or L-shaped cores, each core being attached to a respective side of the polygonal central core, and

a respective transformer coil wound around each corresponding U-shaped or L-shaped core, with the coils electrically interconnected in a delta or star arrangement.

13. (New) The ozone generating apparatus according to claim 12 including respective releasable straps attaching the corresponding U-shaped or L-shaped cores

to the polygonal central core for mounting and demounting the U-shaped and L-shaped cores.

14. (New) The ozone generating apparatus according to claim 9, wherein the n-phase transformer includes

a central polygonal core having a polygonal cross-section with at least n sides,
a plurality of U-shaped or L-shaped cores, each core being attached to a respective side of the polygonal central core, and

a respective reactor coil wound around each corresponding U-shaped or L-shaped core, with the coils electrically interconnected in a delta or star arrangement.

15. (New) The ozone generating apparatus according to claim 14 including respective releasable straps attaching the corresponding U-shaped or L-shaped cores to the polygonal central core for mounting and demounting the U-shaped and L-shaped cores.

16. (New) The ozone generating apparatus according to claim 9 including n fuses or breakers, each fuse or breaker being connected between a respective group of the ozone generating units and a corresponding phase of the n-phase power supply.

17. (New) The ozone generating apparatus according to claim 9, wherein the n-phase power supply detects current flow in each phase and, when the current flow in a phase exceeds a predetermined value, that phase is electrically isolated.

18. (New) The ozone generating apparatus according to claim 9, wherein the n-phase power supply detects the voltage of each phase and, when the voltage of a phase falls below a predetermined value, the phase is electrically isolated.

19. (New) (New) An ozone generating apparatus comprising:

an ozone generator including

a discharge chamber having a high voltage terminal and a low voltage terminal, and

a plurality of multi-layer flat-ozone generating units stacked within the discharge chamber, each ozone generating unit including, alternately stacked, a plurality of flat-plate high-voltage electrodes and low-voltage electrodes, wherein the multi-layer flat-plate ozone generating units are electrically divided into n groups within the discharge chamber, high-voltage electrode terminals of the multi-layer flat-plate ozone generating units within each group are connected together, and low-voltage electrode terminals of all multi-layer flat-plate ozone generating units are connected together; and

an n-phase power supply supplying power to the plurality of multi-layer flat-ozone generating units, the n-phase power supply including

a polyphase rectifier rectifying polyphase alternating current (AC) power received from a commercial power source to produce a rectified voltage,

an n-phase inverter receiving the rectified voltage and producing n-phase AC power, in each of n phases, at a higher frequency than the AC power received from the commercial source,

n serial reactors, one serial reactor being connected in series with each of the phases of the n-phase AC power, and

an n-phase transformer receiving the n-phase AC power transmitted by the n serial reactors and increasing the voltage of the n-phase AC power to produce n-phase high voltage AC power, each phase of the n-phase transformer being connected to a respective high-voltage electrode terminal of a corresponding group of the multi-layer flat-plate ozone generating units, wherein the n-phase transformer includes

a central polygonal core having a polygonal cross-section with at least n sides,

a plurality of U-shaped or L-shaped cores, each core being attached to a respective side of the polygonal central core, and
a respective transformer coil or reactor coil wound around each corresponding U-shaped or L-shaped core, with the coils electrically interconnected in a delta or star arrangement.

20. (New) The ozone generating apparatus according to claim 19 including respective releasable straps attaching the corresponding U-shaped or L-shaped cores to the polygonal central core for mounting and demounting the U-shaped and L-shaped cores.

21. (New) The ozone generating apparatus according to claim 19, wherein the n-phase power supply includes a single low-voltage output that is electrically connected to the low-voltage electrode terminal of the discharge chamber.

22. (New) The ozone generating apparatus according to claim 21 including n parallel reactors, each parallel reactor being connected between a respective phase of the n-phase transformer and the low-voltage terminal of the discharge chamber.

23. (New) The ozone generating apparatus according to claim 19 including n fuses or breakers, each fuse or breaker being connected between a respective group of the ozone generating units and a corresponding phase of the n-phase power supply.

24. (New) The ozone generating apparatus according to claim 19, wherein the n-phase power supply detects current flow in each phase and, when the current flow in a phase exceeds a predetermined value, that phase is electrically isolated.

25. (New) The ozone generating apparatus according to claim 19, wherein the n-phase power supply detects the voltage of each phase and, when the voltage of a phase falls below a predetermined value, the phase is electrically isolated.